

# Quandong Pan

(He/Him)

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## “EMBRACE COMPLEXITY”

- “There is no flood in a single raindrop, no financial crash in a single dollar, and no love in a single carbon atom. Yet, when combined under certain conditions, these simple elements create phenomena far greater and more complex than their individual parts.” — The Science of Complexity

## RESEARCH INTERESTS:

- I am driven to understand the **fundamental principles underlying biological processes** like regeneration, pattern formation and multicellularity etc, through employing **experimental and computational techniques**, including scRNA-seq, multi-omics integration, modeling the intricate dynamics of gene regulatory networks and the epigenetic landscape, ultimately seeking to control these systems through the combined power of **systems biology and bioengineering**.

## FIELDS OF INTEREST IN GENERAL:

- Systems Biology
- Synthetic Biology & Biotechnology
- Metabolic & Genetic Engineering
- Directed Evolution and Optimization of Microorganisms
- Evolutionary Developmental Biology
- Regeneration and Morphogenesis
- Organoids, Biofilms and Multicellularity
- Self-Organization and Emergence
- Multiscale Analysis of Cellular Systems
- Network Science and Complex Systems Modeling
- Attractor Landscape Analysis of GRNs

# EDUCATION

**Bachelor of Science – Major: Life Sciences**

**University of Freiburg**

Oct 2022 — Present

<https://uni-freiburg.de/ucf/las/curriculum/#life-sciences>

# RELEVANT COURSEWORK

- Cell Biology
- Basic Chemistry and Biochemistry
- Genetics and Epigenetics
- Data Science with R
- Computational Genomics
- Human Cognition and Artificial Intelligence
- Engineering with Living Materials

# RESEARCH EXPERIENCE

## RESEARCH INTERNSHIP — BAUMEISTER LAB

**Bioinformatics & Molecular Genetics**

**University of Freiburg, Faculty of Biology**

[https://celegans.biologie.uni-freiburg.de/?page\\_id=391](https://celegans.biologie.uni-freiburg.de/?page_id=391)

[ Oct 2025-Present ]

- The lab studies stress response and signaling pathways in *C. elegans*, which includes:
  - Cross talk between insulin and TOR signaling in tumorigenesis and stress response
  - Signaling function of Parkinson's Disease genes
  - Mitochondrial stress response
- I acquired skills of transgenic *C. elegans* construction, RNAi mediated gene control, fluorescence microscopy, phenotypical and survival analysis etc.

# RESEARCH INTERNSHIP — THE BONASIO LAB

## Molecular Mechanisms of Epigenetic Memory

University Hospital Freiburg

<https://www.bonasiolab.org/#top>

[ 03/04/2024 – 30/04/2024 ]

The lab focuses on the molecular mechanisms of epigenetic memory, particularly interested in elucidating the epigenetic mechanisms of caste transition and reversion in *Harpegnathos saltator* ant:

- My role was primarily focused on conducting behavioral analysis of the *Harpegnathos saltator* ant colony during its transition phase induced by colony separation.

## CONFERENCES

- Horizons in Molecular Biology Symposium 2025 in Göttingen
  - [ 08/09/2025 – 11/09/2025 ] Max Planck Institute for Multidisciplinary Sciences
  - Biochemistry and Molecular Biology, Cell Biology
  - Genome Biology, Developmental Biology
  - Structural Biology, Molecular Neuroscience, Computational Biology
  - Link: <https://www.mpinat.mpg.de/horizons>
- Life Sciences Annual Meeting 2024 in Switzerland
  - [ 13/02/2024 – 15/02/2024 ] University of Lausanne
  - Bioinformatics, Biophysics, Cardiovascular Biology & Physiology
  - Experimental Pharmacology, Ion Channels and Membrane Transporters Microscopy
  - Molecular and Cellular Biosciences, Proteomics and Systems Biology
  - Link: <https://annual-meeting.ls2.ch/2024/program>
- SY-Stem Cell Conference 2024 in Vienna
  - [ 13/03/2024 – 15/03/2024 ] Vienna BioCenter, Austria
  - Early Embryogenesis
  - Neural lineage specification
  - Nervous Systems Development
  - Brain Disease, Regeneration and Novel Technologies
  - Link: <https://www.oeaw.ac.at/imba/seminars-events/past-events/sy-stem-2024>
- Interdisciplinary College 2024 of Complex Systems in Germany:
  - [ 01/03/2024 – 08/03/2024 ]
  - Computational Neuroscience, Machine Learning, Game theory
  - Theoretical Biology and Complex Dynamical Systems Simulation
  - Link: <https://interdisciplinary-college.org/program/>

## SKILLS

- Programming Language :
  - R Language
  - MATLAB and Python
- Software and Platform: R Studio, MATLAB, Github, NetLogo
- Basic Skills in Molecular and Experimental Biology

## LANGUAGE PROFICIENCY

- Chinese (Native)
- English
  - IELTS (Scale of 9)
    - (Overall 7.0, Listening 7.0, Reading 7.5, Speaking, 7.5, Writing 6.5)
  - PTE Academic (Scale of 90)
    - (Overall 86, Listening 80, Reading 90, Speaking, 72, Writing 90)
- German B2